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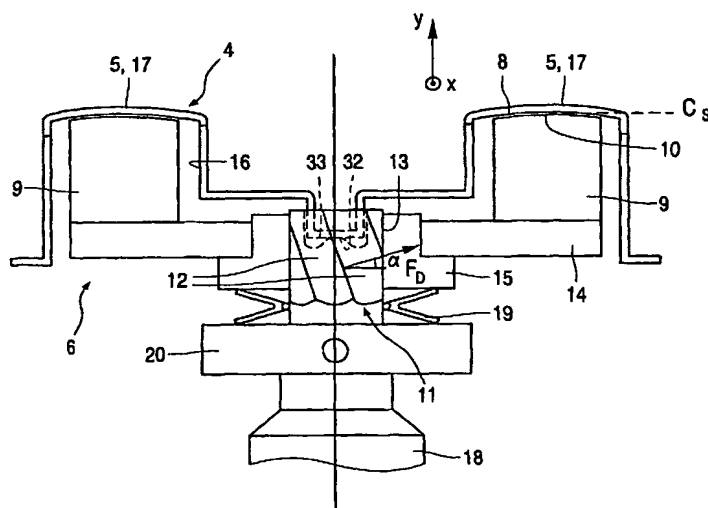
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[Continued on next page]

(54) Title: SHAVING APPARATUS



(57) Abstract: Shaving apparatus with at least one cutting unit (3) having an outer cutter (4) and an inner cutter (6) which is rotationally drivable with respect to the outer cutter by means of an driving shaft (18) of a driving device, which driving shaft exerts a prestress force (FY) on the inner cutter in the direction of the outer cutter. During cutting of a hair, the hair exerts a cutting force (FR) on the inner cutter (6), which force has a direction that is opposite to the driving force (FD) for driving the inner cutter. Claimed is that the driving device comprises only one rotationally drivable coupling element (11) having at least one driving surface (12), that the driving shaft (18) bears axially (32,33) on the outer cutter (4) via said coupling element (11), and that the inner cutter (6) comprises at least one driven surface (13) cooperating with said driving surface (12) for exerting the driving force (FD), the direction of the driving force (FD) being substantially perpendicular to the driving surface (12) and the driven surface (13).



CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE,

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## INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B26B19/14

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B26B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 145 200 A (VAN HOUT JOHANNES A M ET AL) 14 November 2000 (2000-11-14)	1
Y	column 2, line 58 -column 3, line 52; figures 1,2	2
Y	US 3 636 626 A (ZUURVEEN FRANS) 25 January 1972 (1972-01-25) abstract; figure 1	2
A	EP 0 544 065 A (MATSUSHITA ELECTRIC WORKS LTD) 2 June 1993 (1993-06-02) column 6, line 57 -column 7, line 50; figures 2,5	1
A	US 4 675 998 A (THIJSSE CAREL J) 30 June 1987 (1987-06-30) column 2, line 9 -column 3, line 24; figures 1-5	1
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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 001 932 A (HERRICK WALLACE D) 11 January 1977 (1977-01-11) column 2, line 19-28; figure 1 -----	1

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/03069

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6145200	A	14-11-2000	CN 1104308 B	02-04-2003
			DE 69908527 D1	10-07-2003
			EP 0991507 A1	12-04-2000
			WO 9950033 A1	07-10-1999
			JP 2002500542 T	08-01-2002
US 3636626	A	25-01-1972	NL 6812448 A	03-03-1970
			DE 1942106 A1	05-03-1970
			FR 2017136 A5	15-05-1970
			GB 1281836 A	19-07-1972
EP 0544065	A	02-06-1993	JP 5146563 A	15-06-1993
			JP 3193747 B2	30-07-2001
			JP 5146565 A	15-06-1993
			DE 69205803 D1	07-12-1995
			DE 69205803 T2	11-07-1996
			EP 0544065 A1	02-06-1993
			US 5283953 A	08-02-1994
US 4675998	A	30-06-1987	NL 8403065 A	01-05-1986
			AT 44675 T	15-08-1989
			CA 1255089 A1	06-06-1989
			DE 3571570 D1	24-08-1989
			EP 0179515 A1	30-04-1986
			JP 61094674 A	13-05-1986
US 4001932	A	11-01-1977	US 4077120 A	07-03-1978
			AT 334781 B	10-02-1976
			AT 957073 A	15-05-1976
			AU 6159473 A	24-04-1975
			CA 975549 A1	07-10-1975
			CH 562671 A5	13-06-1975
			DE 2357373 A1	30-05-1974
			FR 2207444 A5	14-06-1974
			GB 1406139 A	17-09-1975
			JP 49082453 A	08-08-1974
			NL 7315500 A	21-05-1974
			AT 334780 B	10-02-1976
			AT 617773 A	15-05-1976
			BE 802113 A1	05-11-1973
			CH 580477 A5	15-10-1976
			FR 2193345 A5	15-02-1974
			JP 49056761 A	01-06-1974
			LU 68009 A1	13-09-1973
			NL 7309787 A	16-01-1974
			US 3844033 A	29-10-1974